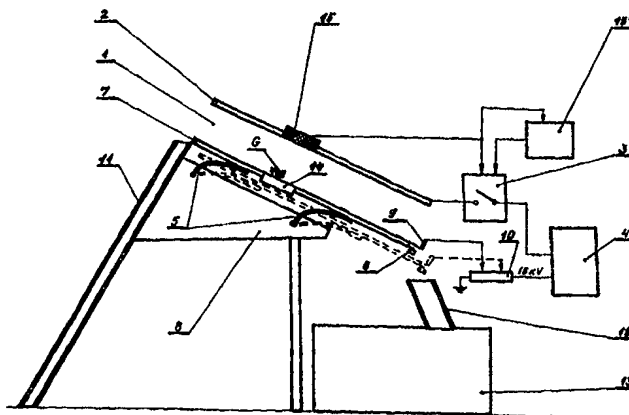




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(54) Title: METHOD AND DEVICE FOR EXTERMINATING PEST ANIMALS



(57) Abstract

The method and the device are applicable in household activities, industry, agriculture, forestry, etc. for exterminating pest animals (G), guaranteeing multipurpose operation, higher efficiency and productivity. The device consists of a passage (1) with an electrode (2) installed above its floor connected to a switch (3) that is connected to the phase of a high tension source (4). The floor is fixed on springs (5) arranged under and an enticement (6) is located in the passage (1), which is inclined and is placed on a rack (8), the enticement (6) being placed on its lower end, and its floor is a second electrode (7) connected with a pin (9) to the runner of a rheostat (10) connected to the zero lead of the high tension source (4). The springs (5) are arch-shaped sheets. To the upper clear of the passage (1) is positioned a replaceable chute (11) with a section according to the sizes of the largest animals to be exterminated. Under the lower clear of the passage (1) is positioned a second chute (12) to a container (13). In an orifice in the floor being placed a light emitter (14), and a light indicator (15) above it, its lead being connected to the first control input of the switch (3) and to the control input of a timer (15'), its output being connected to the second control input of the switch (3).

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METHOD AND DEVICE FOR EXTERMINATING PEST ANIMALS

FIELD OF THE INVENTION

The invention is intended to a method and device for exterminating pest animals, applicable in household activities, industry, agriculture, forestry, etc.

BACKGROUND OF THE INVENTION

A method for exterminating pest animals, i.e. rodents, is known in the art, wherein their extermination is effected by killing them by electricity. According to the method an enticement conducts the rodent to a space limited by two electrodes which it is forced to touch following its way to the enticement. A switch is operated under its weight, that transfers tension to the electrodes. Being in touch with them the rodent secures the flow of electricity and kills itself. The killed rodent is pulled out after disconnecting the electricity [1].

A device performing the above method is known in the art. It consists of a horizontal passage with electrodes installed over its floor, connected to a switch, the floor being provided by springs and mechanically connected to the switch. The bait is located at the end of the passage enticing the rodent to enter and reach it. The distance between the floor and the electrodes is compatible to the dimensions of the type of rodents to kill so that when the animal is advancing to the bait it necessarily touches firmly the electrodes [1].

A disadvantage of the method and device known in the art is that they have a low productivity and low efficiency because the process requires to be interrupted for cleaning the device from the carcass of the killed animal. The device does not affect smaller animals because they are not able to get in touch with the electrodes even if they enter the passage. For example, if there are mice in the area of the device in-

tended for rats, the smaller mice may freely eat the bait. On the other hand, larger pests could not enter the passage and operate the device, and they remain intact. For example, if the device is intended for mice, rats in the area of the device will not be exterminated. This makes it necessary that in areas populated with various pest animals should be placed various types of devices which makes the process expensive and requires staff for cleaning and charging again the devices. That is why it is impossible to make use of the method and the device for exterminating larger pests as mice, rats and other rodents and insects as cockroaches, bugs, beetle, fleas and others at the same time. Another disadvantage of the method and the device is that they do not exterminate the external parasites that live on the exterminated animal as flea, ticks, lice, etc. After a rat dies, for example, the parasites leave it and populate other animals and even human beings and so continue carrying the infection further on.

The invention is intended to create a universal method and device for highly efficient and productive extermination of pests.

TECHNICAL DESCRIPTION OF THE INVENTION

This task is solved by creating a method for exterminating pests, wherein they are exterminated by electric current. By means of a bait the pest animal is guided to a space limited by two electrodes, one of which it necessarily touches following its way to the bait. The pest animal is in contact with one of the electrodes walking over it. Depending on the weight of the pest animal, is determined the intensity of the tension necessary to produce discharges in the space limited by the two electrodes. The discharges exterminate the pest animal. The animal is guided through the space between the two electrodes by making it climb to a determined height. The tension between the two electrodes is supplied after the pest animal has entered deeply in the space between the electrodes. The carcass of the exterminated pest animal is removed by slipping under its gravity down through the space between the elec-

trodes to the corresponding place for carcass collection. After this procedure is over the tension between the electrodes is switched off and the device remains in stand by mode awaiting the next extermination cycle.

According to the method it is possible to supply the tension constantly between the lower electrode and the middle of the upper electrode, supplying the tension to both terminals of the upper electrode immediately after the pest animal enters the zone under the middle part of the upper electrode.

According to the method it is possible the value of the tension range supplied to both electrodes to be enough to kill crawling pest animals of a determined size. In this case the constant tension range value supplied to both electrodes secures the extermination of pest animals instantly when the pest animal rises to reach the enticement.

A device for extermination of pest animals is also created which consists of a passage with an electrode installed on its floor connected to a switch that is connected to the phase of a high tension source. There are springs arranged under the floor, and the enticement is located in the passage which is inclined and is placed on a rack, being the enticement placed in its lower end, and the floor is a second electrode connected with a pin to the runner of a rheostat connected to the zero lead of the high tension source. Springs are arch-shaped sheets. To the upper clear of the passage is positioned a replaceable chute with a section according to the size of the largest animals to be exterminated. Under the lower clear of the passage is placed a second chute to a container. In an orifice in the floor is placed a light emitter, and a light indicator over it. Its lead is connected to the first control input of the switch and to the control input of a timer, its output being connected to the second control input of the switch.

It is possible the upper electrode in the pest animals exterminating device to be divided by insulators in three parts, the middle being connected to the phase of the high tension source, and both remaining

ends are connected to the switch. The light indicator is located in one of the side walls of the passage just behind the boundary between the highest part and the middle one, and the lower electrode is monolithic.

It is possible the lower electrode of the pest animals exterminating device to be stationary and directly connected to the zero lead of the high tension source, the upper electrode being connected directly to its phase electrode, both electrodes being monolithic.

It is possible the lower electrode of the pest animals extermination device to have an orifice located over the neck of the second chute, the first chute being located to the lower part of the lower electrode, the end of the passage being located in the highest part, and the bait being placed at a height h on the inner wall of the bottom.

It is possible the container of the pest animals exterminating device to be a pit in the earth, the second electrode being an inclined plane to the pitfall with moistened soil, ending with a natural vertical surface that is the bottom, and under the first electrode is located a trigger with the enticement which is a bait. The trigger is connected to the control inputs of the switch and the timer. Beneath the trigger, in the soil, there is a heater, connected through a threshold switch to an energy supply source, and a temperature indicator in the soil is connected to a control input of the threshold switch.

A groove could be formed in the upper part of the lower electrode of the pest animals exterminating device, and between the groove and the chute there is an elevated plain platform, and to the upper end of the upper electrode there is an insulation extension.

An advantage of the method and the pest animals exterminating device is that they are universal, of high efficiency and productivity.

DESCRIPTION OF THE FIGURES ATTACHED

The invention is explained in details with a preferred embodiment of the device fulfilling the method for exterminating pest animals shown

on the figures attached, wherein:

- figure 1 shows the structure of the device with light emitter and light indicator;
- figure 2 shows the structure of the device with one indicator only;
- figure 3 shows the structure of the device for a determined size of pest animals;
- figure 4 shows the structure of the device with a bait elevated at the end of the passage;
- figure 5 shows the structure of the device, a land version;
- figure 6 shows the structure of the device with a groove in front of the passage.

EXAMPLES FOR INVENTION PERFORMANCE

The device for exterminating pest animals on fig. 1 consists of a passage 1 with an electrode 2 installed above its floor connected to a switch 3 that is connected to the phase of a high tension source 4. There are springs arranged under the floor 5, and the enticement 6 is located in the passage 1 which is inclined and is placed on a rack 8, being the enticement 6 placed in its lower end, and the floor is a second electrode 7 connected with a pin 9 to the runner of a rheostat 10 connected to the zero lead of the high tension source 4. Springs 5 are arch-shaped sheets. To the upper clear of the passage 1 is positioned a replaceable chute 11 with a section according to the size of the largest animals to be exterminated. Under the lower clear of the passage 1 is positioned a second chute 12 to a container 13. In an orifice in the floor is placed a light emitter 14, and a light indicator 15 over it. Its lead is connected to the first control input of the switch 3 and to the control input of a timer 15', its output being connected to the second control input of the switch 3.

The upper electrode 2 in the pest animals exterminating device on figure 2 is divided by insulators 16 in three parts, the middle 17 being connected to the phase of the high tension source 4, and both remaining ends 18 are connected to the switch 3. The light indicator 15 is

located in one of the side walls of the passage 1 just after the limit between the higher part 18 and the middle part 17, and the lower 7 electrode is monolithic.

The lower electrode 7 of the pest animals exterminating device on figure 3 is stationary and is directly connected to the zero lead of the high tension source 4, being the upper electrode 2 connected to its phase electrode, both electrodes 2, 7 being monolithic.

The lower electrode 7 of the pest animals extermination device on figure 4 has an orifice 19 located above the neck of the second chute 12, the first chute 11 being located to the lower part of the lower electrode 7, the bottom 20 of the passage 1 being located in the higher part, and the enticement 6 being placed at a height h on the inner wall of the bottom 20.

The container 13 of the pest animals exterminating device on figure 5 is a pit in the earth, the second electrode 7 being an inclined plane to the pitfall with moistened soil, ending with a natural vertical surface that is the bottom 20, and under the first electrode 2 is located a trigger 21 with the enticement which is a bait 6. The trigger 21 is connected to the control inputs of the switch 3 and the timer 15'. Beneath the trigger 21, in the soil, there is a heater 22, connected through a threshold switch 23 to an energy supply source 24, and a temperature indicator 25 in the soil is connected to a control input of the threshold switch 23.

A groove 26 is formed in the upper part of the lower electrode 7 of the pest animals exterminating device on figure 6, and between the groove and the chute 11 there is an elevated plain platform 27, and to the upper end of the upper electrode 7 there is an insulation extension 28.

On all figures the exterminated pest animal is indicated with the letter G.

On all figures the chutes 11 and 12 are given schematically. Their section in the real performance is in accordance with the size range of the pest animals G to be exterminated.

APPLICATION OF THE INVENTION

The device performing the method for extermination of pest animals operates as follows:

The pest animal G is exterminated in the device by killing it by means of electric influence: an electric discharge in the space of passage 1 between both electrodes 2 and 7. The pest animal G is guided to a space limited by two electrodes 2 and 7, making it climb to a certain height. The enticement 6 acts with its smell which spreads over the passage 1 and the chute 11, making the pest animal G climb the chute 11 and go to the place limited by both electrodes 2 and 7, being obliged to touch the lower electrode on its way to the enticement 6 while scrolling over. Depending on the weight of the pest animal G, through the springs 5 and the rheostat 10 is determined the value of the tension needed for the formation of discharges in the space between the electrodes that kill the pest animal G. For low weight animals under 30 g the springs do not react, and the runner of the rheostat 10 is in a condition that secures a tension between the electrodes enough to kill any animal of that weight or lighter. Heavier animals G make the springs 5 to deform to the front which leads to a displacement of the pin 9 and, respectively, the runner of the rheostat 10 for securing a higher tension between the electrodes 2 and 7. The position of the runner on the rheostat 10 in these cases depends on the weight of the pest animal G, securing a higher tension for the heavier animals as part of the tension 15 kV of the source 4. The tension between both the electrodes 2 and 7 is supplied after the pest animal G has entered deeply into the space between the electrodes when it crosses the light flow between the light emitter 13 and the light indicator 15, the signal of the latter operates the switch 3 and the timer 15'. The circuit is switched on by the switch 3 and secures the supply of tension by the high voltage source 4 to the electrodes 2 and 7, between them being formed electric discharges precisely in the area where the pest animal G is located. If the animal is

not killed by the first discharge, at withdrawal or when moving around, included uncontrolled rolling ahead, it falls in the area under tension where the next discharges kill it. The carcass of the exterminated pest animal G is disposed from the space between the electrodes by slipping the carcass by its gravity to the place for carcass collecting: the container 13 with the second chute 12. The timer 15' is adjusted in a way that after the carcass is disposed, the tension between both electrodes 2 and 7 is disconnected and the device remains in stand by mode of a new cycle for extermination of a pest animal G. The springs 5 also secure the increase of the space between the electrodes according to the pest animals weight if their weight surpasses the 30 g default. This allows the penetration of larger animals into the space between the electrodes for their extermination.

A constantly flowing tension (figure 2) is possible between the lower electrode 2 and the middle part 17 of the upper electrode and supplying it to the both terminals 18 of the upper electrode immediately after the pest animal G penetrates the area beneath the middle part 17 of the upper electrode. Then the first discharges that appear excite the light indicator 15 by their light influence and it switches on the tension to both terminals 18 of the upper electrode in the described way. Thus again the possibility the pest animal G to run away is prevented.

When the device is intended only for crawling pest animals of a determined type-size, i.e. cock-roaches (figure 3), it is possible the tension range value supplied to both the electrodes 2 and 7 to be a continuous value, directly and continuously secured by the high tension source 4.

It is possible (figure 4) the constant tension range value of the source 4, supplied to both the electrodes 2 and 7, to secure the extermination in the instant when the pest animal G, i.e. rodent, rises to reach the enticement 6. This enticement 6 then is located in the upper part of the passage 1 end. The pest animal G, by intending to reach it, enters the passage 1 from its lower part through the chute 11, after which evades the orifice 19 in the lower electrode 7 climbing to the enticement 6. The

height *h* is an obstacle to the enticement 6 that it overcomes by rising. In this moment, the distance between the highest point of its corpse and the upper electrode 2 is under the critical value and this causes the origination of a sufficiently strong single discharge that kills it. The carcass falls the described way under its gravity through the orifice 19 in the container 13.

It is possible (figure 5) the method to be performed outdoors, the container 13 being prepared as a pitfall in the earth. In order to maintain the surface to the pitfall inclined, as a second electrode 7 its soil is moistened and electrolytic, i.e. by adding some quantities of common salt. The natural vertical surface which is the bottom 20 as an example may be a tree, and under the first electrode 2 the trigger 21 with the enticement which is a bait 6 secures signal to the control inputs of the switch 3 and the timer 15' in the instant when the pest animal G, i.e. a wolf, rises to bite the enticement-bait 6. The electric discharge is originated in the described way which kills it, and its carcass falls into the pitfall-container 13. In order the method to be effective in all climatic conditions, i.e. to maintain the place moistened under the trigger 21 in the soil even at near to zero temperatures, the heater 22 is connected through its threshold switch 23 to the supply source 24, when the temperature indicator 25 in the soil measures a temperature under 4 grades centigrade (°C) and gives a signal for it to the control input of the threshold switch 23.

It is possible (figure 6) when the device is intended for multipurpose extermination of insects, rodents and predators additionally by the groove 26 the larger animals to be forced to jump from the platform 27 over the groove 26 along their way to the enticement 6. The insulation extension 28 does not permit them jump over the passage 1 on its outer side and makes them fall in the space between the electrodes. For the insects the groove 26 is not an obstacle, and they simply crawl it over.

The device on figures 1, 2, 3 and 6 exterminates the same way all

pest animals that are parasites and leave the carcasses of exterminated animals collected in the container 13. As every parasite by leaving the carcass is trying to find another host by following the fresh air flow, this air flows through the chute 11, playing an eticement 6. Trying to reach the chute 11 the parasite leaves the container 13 through the chute 12 and again falls in the space between the electrodes, after which it is exterminated by electric discharges in the described way.

A combination of method and device is possible with other methods and devices known in the art. For example, as in all cases under its own weight the pest animals G killed or only stunned fall in the container 13, it may be partially filled of water or other liquid (not shown on the figures). Thus they will be drown even if only stunned at falling. This allows a lowering of the high tension value supplied. At such a lower tension that only leaves the animal stunned, and maintaining the container 13 empty, it is possible to use the device for hunting live animals.

Working with the device requires certain type of safety measures. The presence of sparks in an open space makes it inapplicable in environments with the constant threat of explosion gases, i.e. methane in mine galleries, household gas in premises. The same is valid for places saturated of dangerous dustlike substances, i.e. wheat dust, gunpowder dust, etc. In this case the device should be used after a provision of additional safety systems (not shown on the figures) that will immediately lock its function when inadmissible concentrations of explosion substances appear.

In order to prevent the electric discharge influence over the radio communications another measures are taken, as shielding, circuit neutralization, etc. (not shown on the figures).

In the case when the device is used outdoors in the modification of figure 5 and is located in risk areas where domestic animals may penetrate, i.e. dogs, cats and/or small children, the constant attention of an operator is needed, who by means of an additional main switch would switch on the tension when the pest animal approaches the device.

CLAIMS

1. A method for exterminating pest animals, wherein they are exterminated by electric influence, as by means of an enticement the pest animal is guided to a space limited by two electrodes, one of which it is forced to touch following its way to the enticement characterized by, that the pest animal is in touch with one of the electrodes while walking over it and depending on the weight of the pest animal, and the value of the tension necessary to produce discharges into the space limited by the two electrodes is determined, the discharges exterminate the pest animal, the animal is guided through the space between the two electrodes by making it climb to a determined height, the tension between the two electrodes is supplied after the pest animal has entered deeply in the space between the electrodes, the carcass of the exterminated pest animal is removed from the space between the electrodes by slipping down by its gravity to the corresponding place for carcass collection, and after this the tension between the electrodes is switched off and the device remains in stand by mode awaiting the next cycle of pest animal extermination.

2. A method according to claim 1 characterized by, that the tension is supplied constantly between the lower electrode and the middle of the upper electrode, supplying the tension to both terminals of the upper electrode immediately after the pest animal enters the zone under the middle part of the upper electrode.

3. A method according to claim 1 characterized by, that the value of the tension range supplied to both electrodes has a value, securing the extermination of crawling pest animals of a determined type-size.

4. A method according to claims 1 and 3 characterized by, that the constant tension range value supplied to both electrodes secures the extermination of pest animals in the instant when the pest animal rises to reach the enticement.

5. A device for exterminating pest animals, consisting of a passage with an electrode placed above its floor connected to a switch that is connected to the phase of a high tension source, the floor, being fixed on springs arranged under it and an enticement, is located in the passage characterized by, that the passage (1) is inclined and is placed on a rack (8), being the enticement (6) placed in its lower end, and the floor is a second electrode (7) connected with a pin (9) to the runner of a rheostat (10) connected to the zero lead of the high tension source (4), the springs (5) being arch-shaped sheets, wherein to the upper clear of the passage (1) is positioned a replaceable chute (11) with a section according to the size of the largest animals to be exterminated, and under the lower clear of the passage (1) is positioned a second chute (12) to a container (13), in an orifice in the floor being placed a light emitter (14), and a light indicator (15) above it, its lead being connected to the first control input of the switch (3) and to the control input of a timer (15'), its output being connected to the second control input of the switch (3).

6. A device for exterminating pest animals according to claim 5 characterized by, that the upper electrode (2) is divided by insulators (16) in three parts, the middle part (17) being connected to the phase of the high tension source (4), and both terminals (18) are connected to the switch (3), wherein the light indicator (15) is located in one of the side walls of the passage (1) just after the boundary between the higher part (18) and the middle part (17), and the lower electrode (7) is monolithic.

7. A device for exterminating pest animals according to claim 5 characterized by, that the lower electrode (7) is stationary and is directly connected to the zero lead of the high tension source (4), the upper electrode (2) being directly connected to its phase lead, and both electrodes (2, 7) being monolithic.

8. A device for exterminating pest animals according to claims 5 and 7 characterized by, that the lower electrode (7) has an orifice (19) positioned above the second chute (12), the first chute (11) being located to

the lower part of the lower electrode (7), the passage (1) having a bottom (20) in its higher part, and the enticement (6) being placed at a height ***h*** on the inner wall of the bottom (20).

9. A device for exterminating pest animals according to claims 5, 7 and 8 characterized by, that the container (13) is a pit in the earth, the second electrode (7) being an inclined plane to the pitfall with moistened soil, ending with a natural vertical surface that is the bottom (20), and under the first electrode (2) is located a trigger (21) with the enticement which is a bait (6), the trigger (21) being connected to the control inputs of the switch (3) and the timer (15'), wherein in the place beneath the trigger (21), in the soil, there is a heater (22), connected through a threshold switch (23) to an energy supply source (24), and a temperature indicator (25) in the soil is connected to a control input of the threshold switch (23).

10. A device for exterminating pest animals according to claims 5 and 6 characterized by, that a groove (26) is made in the upper part of the lower electrode (7), and between the groove (26) and the chute (11) there is an elevated plain platform (27), and to the upper end of the upper electrode (7) there is an insulation extension (28).

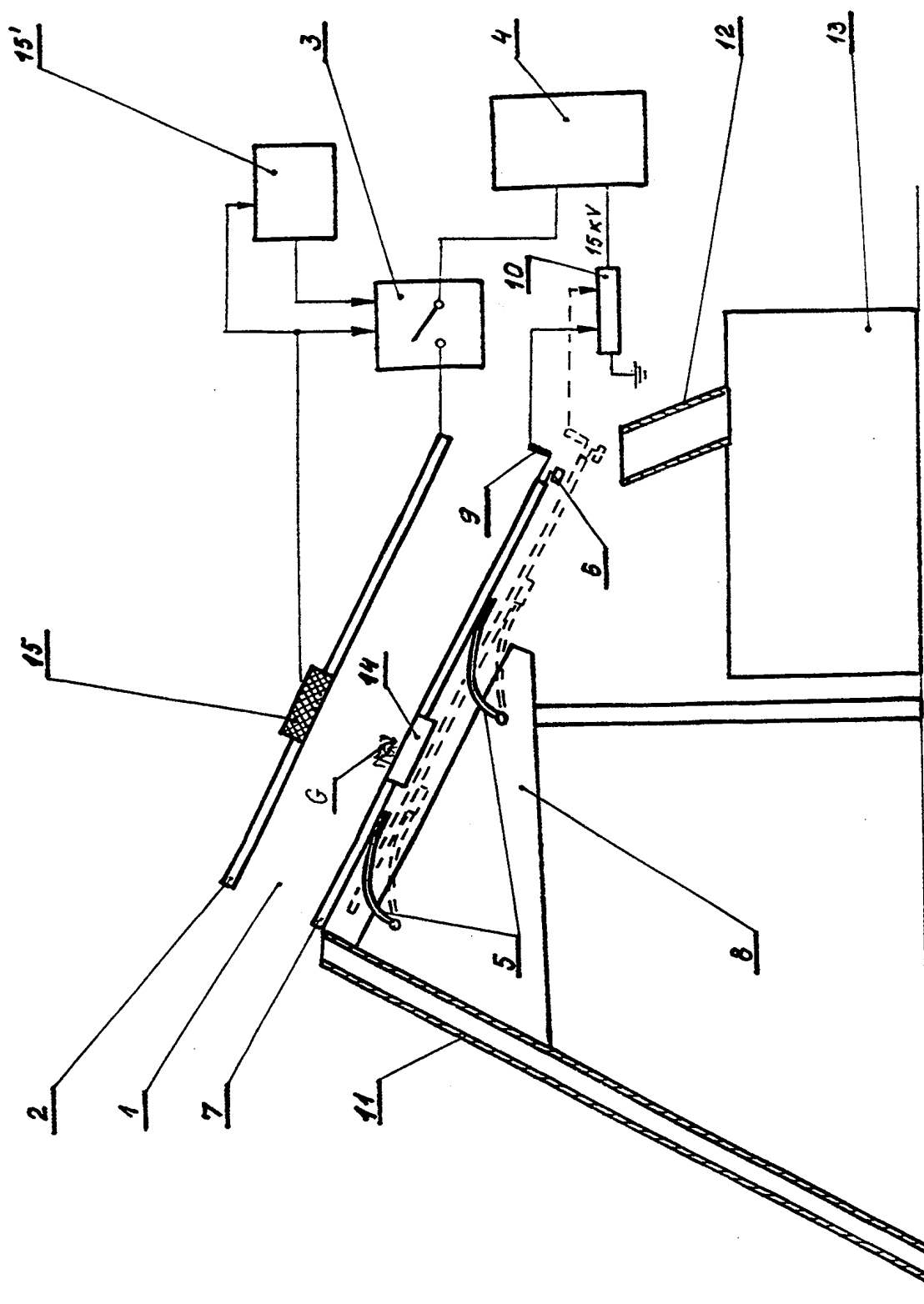


Fig. 1

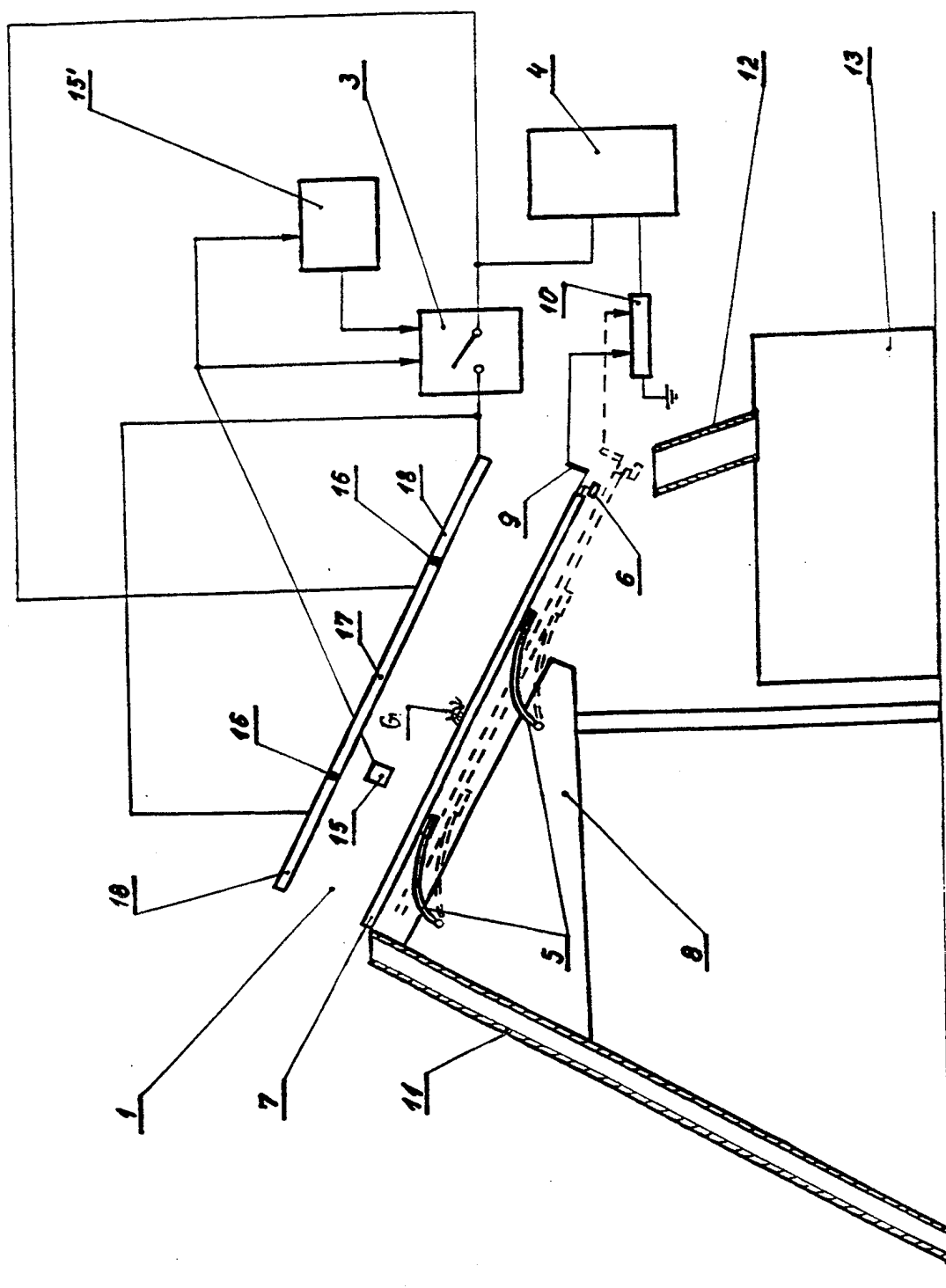


Fig. 2

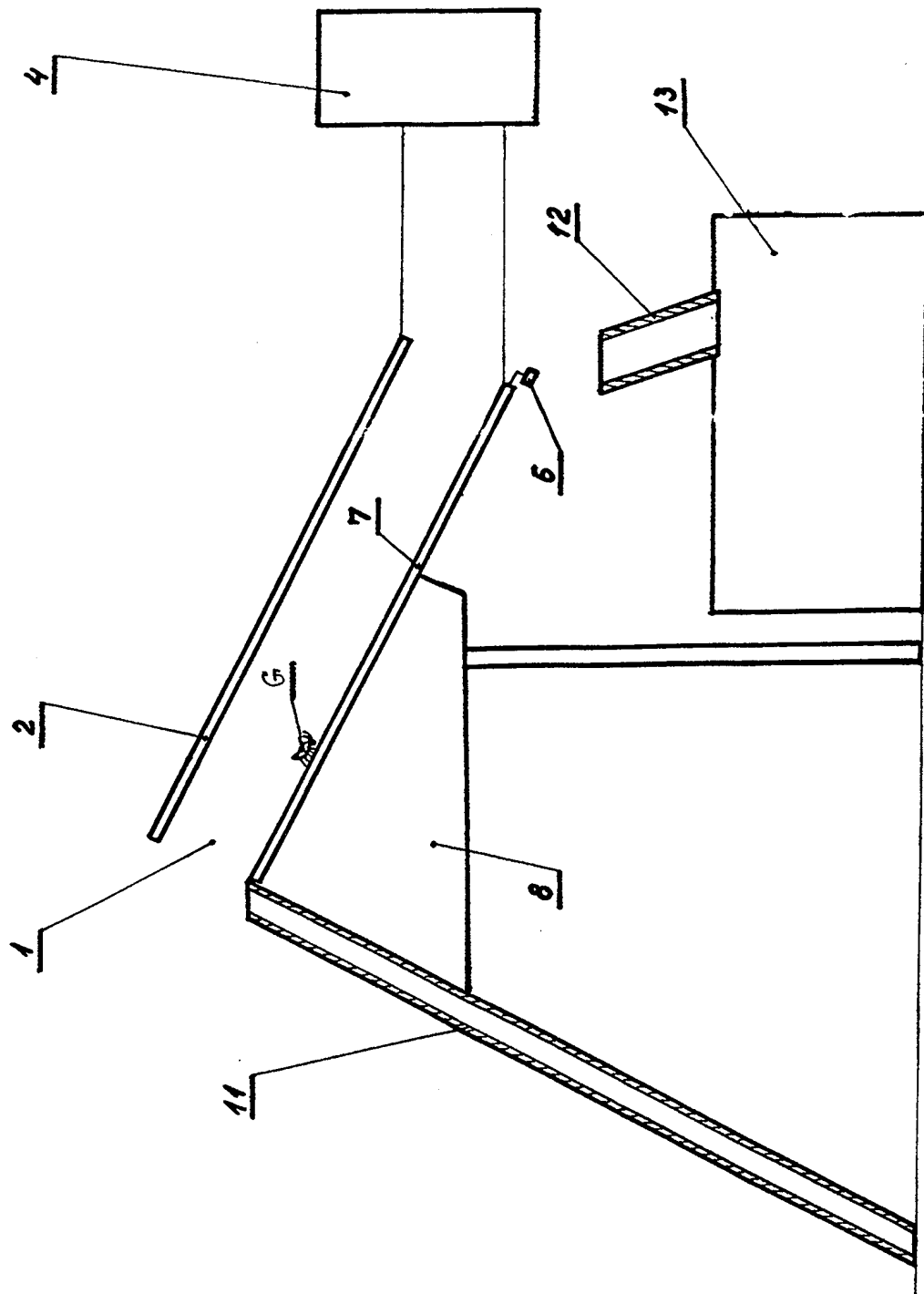
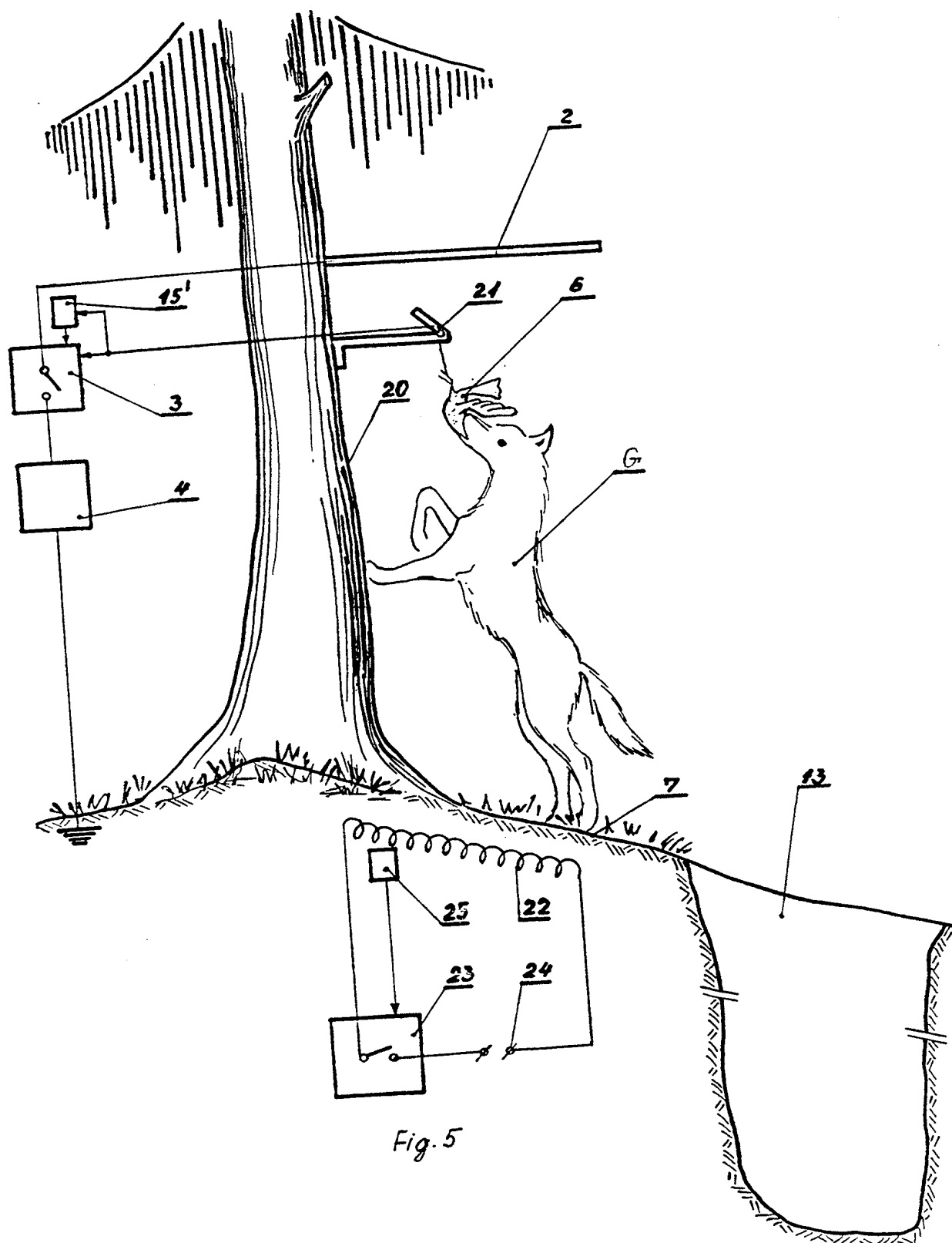


Fig. 3



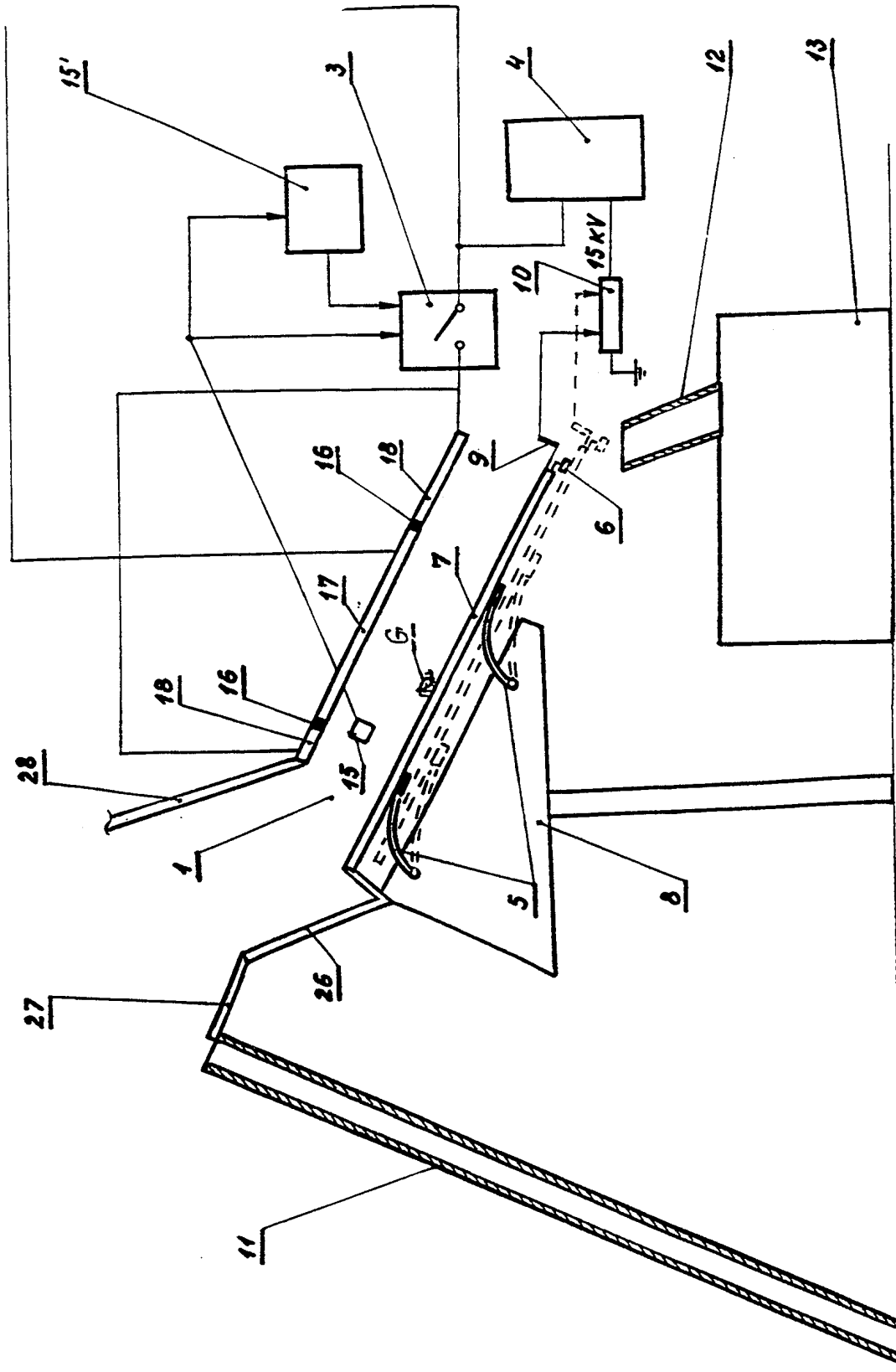


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No

PCT/BG 98/00017

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A01M23/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 023 398 A (MUNNS R H) 3 January 1980 see page 1, line 81 - page 2, line 81 see claims; figures ---	1,5
A	GB 594 894 A (ELECTRONIC TRAPS) see page 2, line 84 - page 5, line 29 see claims; figures ---	1,5
A	FR 893 117 A (WUTRICH) 16 June 1944 see the whole document --- -/-	

☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

19 January 1999

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29/01/1999

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Piriou, J-C

INTERNATIONAL SEARCH REPORT

Interr: 1al Application No

PCT/BG 98/00017

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^a	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p> DATABASE WPI Section PQ, Week 8828 Derwent Publications Ltd., London, GB; Class P14, AN 88-196612 XP002090286 & SU 1 360 684 A (STASHEVSKII I I) , 23 December 1987 cited in the application see abstract ----- </p>	1,5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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GB 594894 A		NONE	
FR 893117 A	16-06-1944	NONE	

PUB-NO: WO009918780A1
DOCUMENT-IDENTIFIER: WO 9918780 A1
TITLE: METHOD AND DEVICE FOR
EXTERMINATING PEST ANIMALS
PUBN-DATE: April 22, 1999

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EUR-CL (EPC): A01M001/02 , A01M001/22 ,
A01M023/38 , A01M031/00

ABSTRACT:

CHG DATE=19990702 STATUS=O>The method and the device are applicable in household activities, industry, agriculture, forestry, etc. for

exterminating pest animals (G), guaranteeing multipurpose operation, higher efficiency and productivity. The device consists of a passage (1) with an electrode (2) installed above its floor connected to a switch (3) that is connected to the phase of a high tension source (4). The floor is fixed on springs (5) arranged under and an enticement (6) is located in the passage (1), which is inclined and is placed on a rack (8), the enticement (6) being placed on its lower end, and its floor is a second electrode (7) connected with a pin (9) to the runner of a rheostat (10) connected to the zero lead of the high tension source (4). The springs (5) are arch-shaped sheets. To the upper clear of the passage (1) is positioned a replaceable chute (11) with a section according to the sizes of the largest animals to be exterminated. Under the lower clear of the passage (1) is positioned a second chute (12) to a container (13). In an orifice in the floor being placed a light emitter (14), and a light indicator (15) above it, its lead being connected to the first control input of the switch (3) and to the control input of a timer (15'), its output being connected to the second control input of the switch (3).